Amendments to the Claims:

Please amend the claims as follows:

1. (Currently Amended) An optical system comprising:

a source for producing optical signals;

an optical waveguide having a noise producing element and an optical filter element;

a receiver for converting applied optical signals into electrical signals;

a coupler for coupling said produced optical signals into said optical waveguide and for coupling reflections from said noise producing element and from said optical filter element to said receiver as applied optical signals; and

a noise reduction system for removing noise produced by said noise producing element from said electrical signals<u>, wherein the noise reduction system performs a frequency analysis of the electrical signals to identify periodic noise</u>.

2. (Original) The system of claim 1 wherein the noise reduction system averages broadband noise and then subtracts the averaged level from the electrical signals.

3. (Canceled) The system of claim 1 wherein the noise reduction system performs a frequency analysis of the electrical signals to identify periodic noise.

4. (Currently Amended) The system of claim [[3]] <u>1</u> wherein the noise reduction system further removes the periodic noise from the electrical signals.

5. (Original) The system of claim 4 wherein the noise reduction system removes the periodic noise by gating the periodic noise out of the electrical signals.

6. (Currently Amended) The system of claim [[3]] <u>1</u> wherein the frequency analysis is a Fourier analysis.

7. (Original) The system of claim 5 wherein the noise reduction system averages broadband noise and then subtracts the averaged level from the electrical signals.

8. (Original) The system of claim 1 wherein the optical filter element includes a fiber Bragg grating.

9. (Original) The system of claim 1 wherein the optical waveguide includes a discontinuity.

10 (Original) The system of claim 1 wherein the discontinuity is a splice.

11. (Currently Amended) A sensor comprising:

a source for producing optical signals;

an optical waveguide having a noise producing element and an optical filter element;

a receiver for converting applied optical signals into amplified electrical signals;

a coupler for coupling said produced optical signals into said optical waveguide and for coupling reflections from said optical waveguide as applied optical signals to said receiver; and

a signal processor for removing noise produced by said noise producing element from said electrical signals, wherein said signal processor performs a frequency analysis of the electrical signals to identify and remove periodic noise from the electrical signals.

12. (Original) The sensor of claim 11 wherein said signal processor subtracts an averaged noise level from the electrical signals.

13. (Canceled) The sensor of claim 11 wherein said signal processor performs a frequency analysis of the electrical signals to identify and remove periodic noise from the electrical signals.

14. (Currently Amended) The sensor of claim [[13]] 11 wherein the frequency analysis is a Fourier analysis.

15. (Canceled) The sensor of claim 13 wherein said signal processor subtracts an averaged noise level from the electrical signals.

16. (Original) The sensor of claim 11 wherein the source includes a tunable laser.

17. (Original) The sensor of claim 11 wherein the source includes a broadband light source and a tunable filter.

18. (Original) The system of claim 11 wherein the optical filter element includes a fiber Bragg grating.

19. (Original) The system of claim 11 wherein the optical waveguide includes a discontinuity.

20. (Currently Amended) The system of claim [[11]] <u>19</u> wherein the discontinuity is a splice.

21. (Currently Amended) A method of compensating for optical reflection comprising:

producing an optical signal;

coupling the optical signal into an optical waveguide having a noise producing element and an optical filter element;

converting reflections along the optical waveguide into electrical signals; and

removing noise produced by the noise producing element from the electrical signals such that the electrical signals from the optical filter element are retained<u>, wherein removing noise includes performing a frequency analysis and then gating out periodic noise produced by the noise producing element from the electrical signals</u>.

22. (Original) The method of claim 21 wherein removing noise includes finding an average noise level and subtracting that average noise level from the electrical signals.

23. (Canceled) The method of claim 21 wherein removing noise includes performing a frequency analysis and then gating out noise produced by the noise producing element from the electrical signals.

24. (Canceled) The method of claim 22 wherein removing noise includes performing a frequency analysis and then gating out noise produced by the noise producing element from the electrical signals.

25. (New) The method of claim 1, wherein the noise reduction system identifies periodic noise by identifying a rapidly varying signal from the frequency analysis.

26. (New) The method of claim 11, wherein said signal processor identifies periodic noise by identifying a rapidly varying signal from the frequency analysis.

27. (New) The method of claim 21, wherein gating out the periodic noise comprises removing a rapidly varying signal from the frequency analysis.